REMARKS

The Examiner now rejects claim 20 (and most of the dependent claims) under 35 U.S.C. 103(a) as being unpatentable over Jain (US 6,765,914) in view of the newly cited reference Walker (US 6,701,375).

As a bit of a review, Jain discloses a method for configuring subnets within a network architecture having a plurality of switches and a router coupled together by a shared bus (see preamble of claim 1). This configuration is said to be flexible because it is irrespective of device boundaries of the switches (col.3, line 67 – col.4, line 2). As an example, subnet 401 comprises hosts coupled to different switches (col.4, lines 22-29 and Fig.4).

To achieve this, Jain teaches to map each subnet with one respective VLAN designated by a VLAN ID (col.4, lines 48-52). Then, the VLAN ID is stored in the egress list of each local switch port coupled to a member host of the VLAN-defined subnet (col.4, lines 54-58) and also of each bus connecting switch port of each switch coupled to a member host (col.4, lines 59-61).

Once such configuration steps have been achieved, packets can be routed between hosts within the network based on the VLAN ID and the destination MAC address they include (col.5, line 31 – col.6, line 27 and Fig.7).

To put it briefly, Jain thus discloses a configuration method comprising defining one or more subnets each associated with one respective VLAN.

Claim 20 of the present application recites a very different subject-matter, namely a method for providing a virtual private network (VPN) service through a shared network infrastructure, in which some of the CE interfaces are allocated to a VPN supporting a plurality of virtual local area networks (VLANs).

To achieve this, the method of claim 20 recites to establish at least one virtual circuit in the shared network infrastructure, in order to allow transmission between CE interfaces allocated to a given VPN and belonging to two PE devices corresponding to a common VLAN identifier.

In this way, a set of point-to-multipoint connections is automatically established in a given VPN, without the need of manual configuration to be carried out, as explained in the specification of the present application (see e.g. paragraph beginning at page 5, line 4).

According to the text of the office action, it is understood that the Examiner considers that the network architecture 100 of Jain would be a shared network infrastructure, the hosts would be CE devices, the switches 120, 130, 140 would PE devices, the subnets 401-403 would be respective VLANs within a single VPN (although the expression VPN is never used in Jain and rather the whole network architecture 100 is said to be preferably included in a chassis).

According to claim 20 of the present application, a correspondence between each CE interface and a VLAN identifier is automatically learned from the VLAN identifier included in at least one tagged frame received from a CE device at each CE interface (step 1). Then, it is detected whether a pair of CE interfaces belonging to two PE devices corresponds to a common VLAN identifier (step 2). Finally, in response to such detection, at least one virtual circuit is established in the shared network infrastructure between said two PE devices, for forwarding frames including said common VLAN identifier.

In sharp contrast, as mentioned above, Jain discloses a configuration method for defining subnets within a network. For this configuration, one VLAN ID is specifically defined for use in each host-switch interface of a given subnet (col.4, lines 48-52). This configuration is thus "manual", i.e. it results from the choice of a VLAN ID for a respective subnet. Before this configuration step, no VLAN ID is included in any frame that may be received from a host. Consequently, no correspondence between each host-switch interface and a VLAN ID is automatically learnt depending on a VLAN ID <u>that would be received</u> at a switch from a host.

Moreover, in the method of Jain, there is no need to detect whether a pair of host-switch interfaces belonging to two different switches would correspond to a common VLAN ID so as to establish a virtual circuit in the shared network infrastructure between two switches. On the contrary, as soon as the above mentioned configuration step is completed, a packet sent by a sending host can be routed to a destination host based on the MAC address of the destination host. If the

destination MAC address (and not the VLAN ID as mentioned by the Examiner) does not belong to a local switch port, the packet is forwarded to the switch's bus connecting port, then to the bus and it is retrieved by all other switches before being accepted by the destined switch based on the destination MAC address (steps 710, 730, 735, 740 and 750).

Therefore, it is true, as noted by the Examiner, that the connection of a virtual circuit in the shared network infrastructure is not taught by Jain. But the establishment of a connection in the shared network infrastructure <u>in response to the detection</u> of whether a pair of CE interfaces belonging to two PE devices correspond to a common VLAN ID is not disclosed, either, by Jain.

Due to these numerous differences (manual configuration rather than automatic correspondence learning, absence of detection of whether a pair of interfaces belonging to two different switches would correspond to a common VLAN ID and absence of establishment of a connection in the shared network infrastructure in response to such detection), Jain cannot be considered as a basis to lead one skilled in the art to the subject-matter of claim 20 of the present application. Therefore, the obviousness rejection based on Jain + Walker (or any other reference combined with Jain) cannot be maintained.

For sake of completeness however, the teaching of Walker is analyzed below.

Walker discloses a method for establishing a communications path between two host computers in a low-bandwidth intranet (see claim 1). To do so, a pathway is established between the hosts at the time that transmission of message is desired and by use of a coordination channel of a network of the intranet (col.4, l.49-54). In a way, Walker thus indeed discloses the establishment of a virtual circuit between said routers (col.2, l.56-28). However, the following should be noted.

First, the method taught by Walker is specifically adapted to routers of an intranet, which makes it a "locally located" solution (see col.1, l.13 and l.32). Consequently, only LANs (Local Area Networks) are part of the described architecture. This is a significant difference with the subject-matter of the present invention, as claimed in claim 20, which involves a virtual private network supporting a plurality of virtual local area networks.

Second, Walker does not teach or even suggest either receiving a tagged frame from a CE device at a CE interface or learning a correspondence between a CE interface and a VLAN identifier included in a tagged frame. This is due in particular to the absence of VLAN in the architecture of Walker. Likewise, by contrast with the subject-matter of claim 20 of the present application, no detection of a pair of CE interfaces allocated to a VPN and belonging to two PE devices corresponding to a common VLAN identifier is taught by Walker.

Thus, only the establishment of a virtual circuit could possibly be considered as being disclosed by Walker. However, it will be noted that the virtual circuit is not established in response to a detection of a pair of CE interfaces allocated to a VPN and belonging to two PE devices corresponding to a common VLAN identifier (such detection not being taught by Walker). And the established virtual circuit is not used for forwarding frames including a common VLAN identifier (no VLAN identifier being used in Walker).

Therefore, Walker does not disclose the other above-mentioned claimed features that Jain fails to teach. And one skilled in the art would not be led to the subject-matter of claim 20 of the present application even when combining the teaching of Walker with that of Jain.

The subject-matter of Claim 20 is thus new and non-obvious over Jain in view of Walker. The same applies to Claim 49 for the same reasons. The other claims 21-33 and 50-58 are submitted to be allowable as well, in particular since they depend on Claim 20 or 49 directly or indirectly.

The Examiner further rejects claim 20 under 35 U.S.C. 102(e) as being unpatentable over Bryden (US 6,717,944).

The Bryden reference was previously used in an obviousness rejection under 35 U.S.C. 103, in combination with Jain.

Bryden discloses an allocation of virtual circuits in a communication network, based upon address resolution requests (col.2, l.24-26).

To do so, an address resolution request identifying a destination node is sent by a source node, through a local edge node. The latter forwards the address

resolution request to all remote edge nodes in a VPN, which leads to the establishment of a tunnel between the local edge node and the remote edge node supporting the destination node. Respective virtual circuits are allocated between the local edge node and the source node on the one hand, and between the remote edge node and the destination node on the other hand. Both virtual circuits are mapped to the tunnel established between the local edge node and the remote edge node, so as to ensure message transmission between the source node and the destination node (see col.2, l.26-48 and Fig.3).

An object of Bryden is thus to allow a communication between CE nodes supporting Frame Relay protocol, even when they are connected through a VPN supporting the IP protocol only.

Thus, the virtual circuits mentioned in Bryden are allocated locally between CE nodes and PE nodes. They are quite different from the virtual circuit recited in claim 20 of the present application, which extends in the shared network infrastructure between PE devices.

The Examiner attempts to circumvent this difference by indicating that the IP tunnel established between the local edge node and the remote edge node would be the virtual circuit of the present invention. This is not the case.

Moreover, in Bryden, there is no use of any VLAN. Likewise, tagged data frames including VLAN identifiers are neither mentioned nor suggested by Bryden. The address resolution request disclosed by Bryden cannot be compared to such tagged data frame including a VLAN identifier, in particular because it only identifies a destination node, irrespective of any belonging of this destination node or of the source node to any (undisclosed) VLAN.

The teaching of Bryden is thus quite different from the subject-matter of claim 20 of the present application, which must thus be considered as not anticipated. The same applies to Claim 49 for the same reasons. Claims 21-33 and 50-58 are submitted to be allowable, as well, in particular since they depend on Claim 20 or 49 directly or indirectly.

It is therefore submitted that this application distinguishes from the cited references, and is allowable thereover. The Examiner's further and favorable reconsideration is therefore requested.

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